



# Space Launch System Solid Rocket Booster

NASA's Space Launch System (SLS) Solid Rocket Booster (SRB) is based on three decades of knowledge and experience gained with the Space Shuttle booster and improved with the latest technology.

With more payload mass and volume than any existing rocket, as well as more energy to send missions through space, SLS has the capability to send human and robotic explorers to deep space destinations including asteroids and eventually Mars and beyond.

## Five Segment Solid Rocket Booster

The SLS booster is the largest, most powerful solid propellant booster ever built. Standing 17

### Solid Rocket Booster Details

Length: 177 feet

Diameter: 12 feet

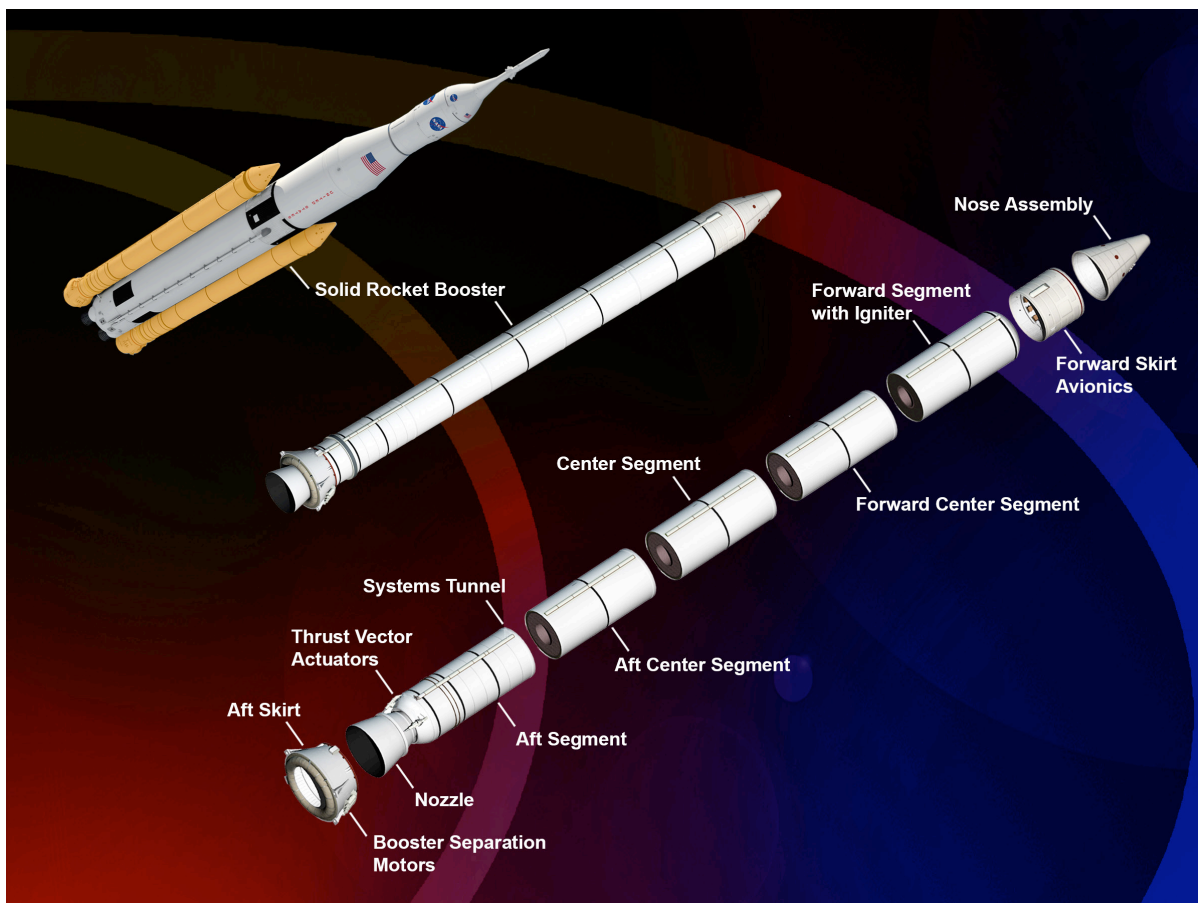
Weight: 1.6 million pounds each

Propellant: polybutadiene acrylonitrile (PBAN)

Thrust: 3.6 million pounds each

Operational time: 126 seconds

NASAfacts



stories tall and burning approximately six tons of propellant every second, each booster generates more thrust than 11 four-engine jumbo commercial airliners. Together, SLS' twin boosters provide more than 75 percent of the total SLS thrust at launch.

The major physical difference between the Shuttle and SLS boosters is the addition of a fifth propellant segment to the four-segment Shuttle booster, allowing NASA's new launcher to lift more weight than the Shuttle. Additionally, the SLS booster will be optimized for a single use, while the Shuttle booster was designed to be reused. Though based on the Shuttle booster, the SLS booster benefits from several design, process, and testing improvements for greater performance, safety, and affordability.

The boosters are manufactured by Orbital ATK in Utah. The largest single component is the five segment solid rocket motor. They undergo a rigorous nondestructive inspection process to confirm each motor's readiness for flight.

The booster forward skirt houses booster avionics that communicate with the SLS avionics to monitor booster conditions and steer the booster exhaust nozzle. The aft skirt contains the thrust vector control (TVC) system that steers the nozzle based on commands from the booster avionics. The frustum and nose cone serve as the aerodynamic fairing for the booster.

Booster hardware is shipped by rail to Kennedy Space Center for assembly. Each booster is mated to the SLS Core Stage by braces on the forward and aft booster segments. On the launch pad, the booster carries the entire weight of the fueled SLS launch vehicle. After launch, the boosters operate for about two minutes before separating from the Core Stage.

## Solid Rocket Booster Improvements

25% more propellant

New nozzle design

New asbestos-free insulation and liner configuration

New avionics

Improved nondestructive evaluation processes



NASA and Orbital ATK have successfully completed three full-scale development test firings of the 5-segment solid rocket motor, as well as the important booster Critical Design Review.



For more information on SLS, visit:

<http://www.nasa.gov/sls/>

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